

WHAT IS CLAIMED IS:

1           1. An ink-jet recording apparatus comprising:  
2           an ink-jet recording head for ejecting the ink;  
3           an ink supply channel connecting an ink cartridge for  
4 storing ink and said ink-jet recording head, said ink supply  
5 channel having a portion inclined in relation to the horizontal  
6 direction formed in said ink supply channel; and  
7           a filter plate placed so as to diagonally traverse said  
8 inclined portion.

1           2. An ink-jet recording apparatus comprising:  
2           an ink-jet recording head for ejecting the ink;  
3           an ink supply channel connected to an ink cartridge for  
4 storing ink;  
5           an upper filter chamber connected to said ink supply  
6 channel and gradually expanding toward said ink-jet recording  
7 head side;  
8           a plurality of lower filter chambers each gradually  
9 expanding toward said ink cartridge side and formed under said  
10 upper filter chamber;  
11           a plurality of throughholes connecting to said lower  
12 filter chamber and said ink-jet recording head; and  
13           a filter plate placed between said upper filter chamber  
14 and said lower chambers.

1           3. The ink-jet recording apparatus according to claim

2 2, wherein said lower filter chambers are offset relative to  
3 said upper filter chamber in the horizontal direction.

1 4. The ink-jet recording apparatus according to claim  
2 2, wherein said ink-jet recording head includes common ink  
3 chambers and ink introducing ports formed in said each common  
4 ink chambers, and said throughholes are connected to said each  
5 ink supply ports.

1 5. The ink-jet recording apparatus according to claim  
2 2 further comprising a partition separating said lower filter  
3 chambers, said partition having a triangular pyramidal cross-  
4 section and a tip of said partition being contacted with the  
5 filter plate.

1 6. The ink-jet recording apparatus according to claim  
2 2, wherein said plurality of lower filter chambers communicate  
3 with each other below said filter plate.

1 7. The ink-jet recording apparatus according to claim  
2 2, wherein said throughholes communicating with said plurality  
3 of lower filter chambers are positioned as close as possible to  
4 vertical lines extending from wall surfaces of said upper  
5 filter chamber.

1 8. The ink-jet recording apparatus according to claim

2 1, wherein said filter plate is formed of a sintered unwoven  
3 fabric made of metal fibers having a high void ratio and a  
4 small mesh size.

1 9. An ink-jet recording apparatus comprising:  
2 an ink-jet recording head for ejecting the ink of a  
3 plurality of colors; and  
4 a plurality of ink supply needles engaging with ink  
5 supply ports of an ink cartridge for storing ink of a plurality  
6 of colors to supply ink to said recording head, adjacent ones  
7 of said ink supply needles being arranged to have a height  
8 difference therebetween.

1 10. The ink-jet recording apparatus according to claim  
2 9, wherein said ink supply needles has five needles and said  
3 ink has five colors including light cyan, deep cyan, light  
4 magenta, deep magenta and yellow, and the tips of the central  
5 ink supply needle and of the ink supply needles on both sides  
6 protrude a fixed length relative to the tips of the remaining  
7 ink supply needles.

1 11. The ink-jet recording apparatus according to claim  
2 10, wherein said ink-jet recording head has ink introducing  
3 ports, said ink supply needles and said ink introducing ports  
3 are aligned on first and second straight lines, respectively,  
4 the first and second straight lines are spaced by a distance

5 larger than the diameter of said ink supply needles in the  
6 horizontal direction, said ink supply needles and said ink  
7 introducing ports are respectively connected by channels each  
8 extending substantially in the horizontal direction and having  
9 a width substantially equal to the diameter of said ink supply  
10 needle, and filters are horizontally placed in said channels.

1 12. The ink-jet recording apparatus according to claim  
2 10, wherein said channel is partitioned by said filter plate  
3 such that the upper portion thereof has a larger volume than  
4 the lower portion thereof.

1 13. The ink-jet recording apparatus according to claim  
2 10, wherein an internal upper surface of said channel is  
3 inclined upwardly toward said ink supply needle side.

1 14. The ink-jet recording apparatus according to claim  
2 1, further comprising another filter plate which is placed  
3 between said ink cartridge and said ink supply channel.

4 15. The ink-jet recording apparatus according to claim  
5 3, wherein said ink-jet recording head includes common ink  
6 chambers and ink introducing ports formed in said each common  
7 ink chambers, and said throughholes are connected to said each  
8 ink supply ports.